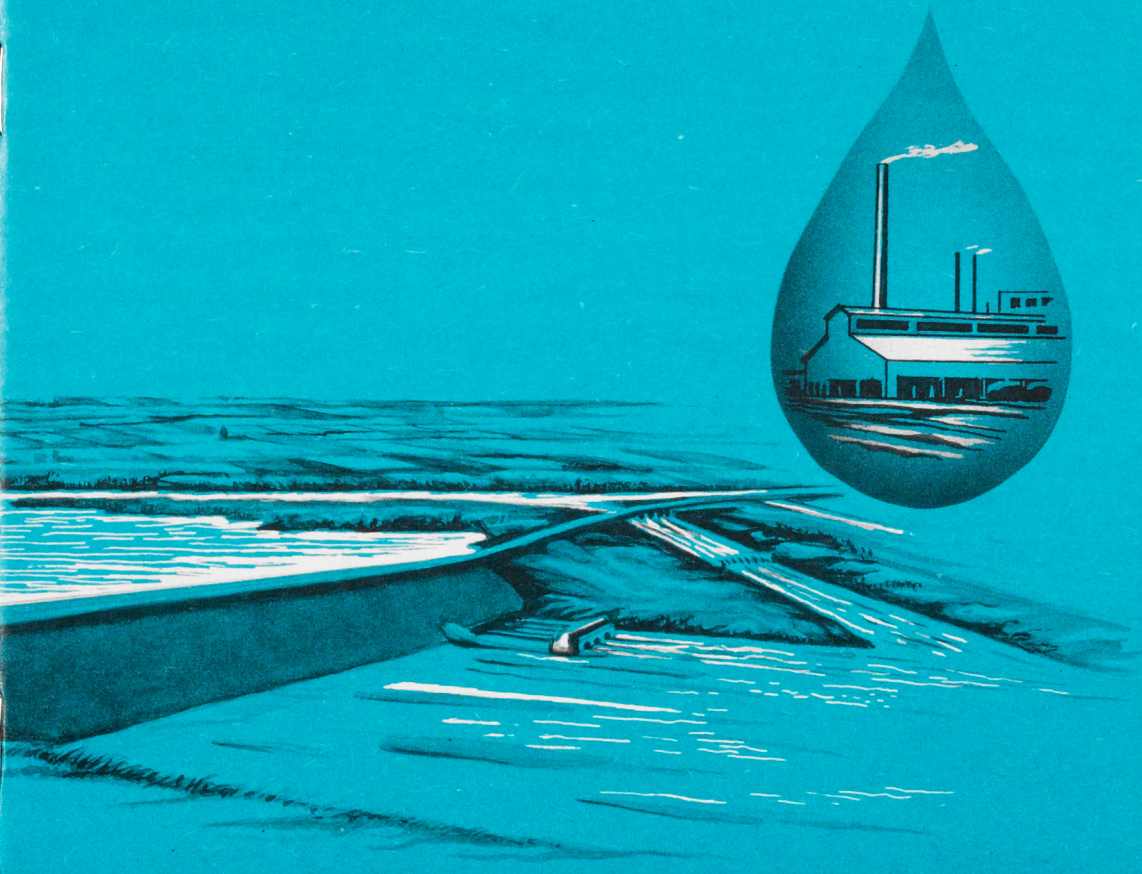


# HARNESSING

## *The South Saskatchewan*





# WATER—A VITAL RESOURCE

Water is the first essential of life . . . for human beings, animals and plants . . . for cities and industries!

It takes 30,000 gallons of water to grow a bushel of wheat; 500,000 gallons for a ton of hay.

Production of a ton of steel requires 65,000 gallons of water; a ton of paper—39,000; and a barrel of oil—770 gallons.

Water, properly harnessed, can be converted into electricity . . . piped into homes . . . distributed over thirsty farmlands.

The people of southern Saskatchewan, knowing the havoc wrought by drought and drifting soil, are now looking to the broad South Saskatchewan to help supply the ever-increasing demands of agriculture and industry—for water!

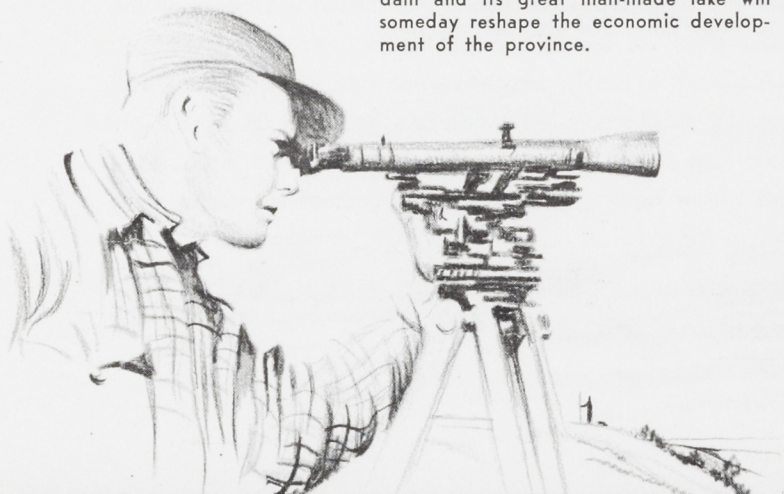


# THE SOUTH SASKATCHEWAN RIVER DEVELOPMENT PROJECT

On July 25th, 1958, the governments of Canada and Saskatchewan signed an agreement which authorized the construction of a multi-purpose water conservation project on the South Saskatchewan River.

Irrigation • power • flood control • recreation • rural and urban water supply — these are the objectives of the gigantic South Saskatchewan River Development Project.

Where the South Saskatchewan elbows north through drought-ridden land, a dam and its great man-made lake will someday reshape the economic development of the province.

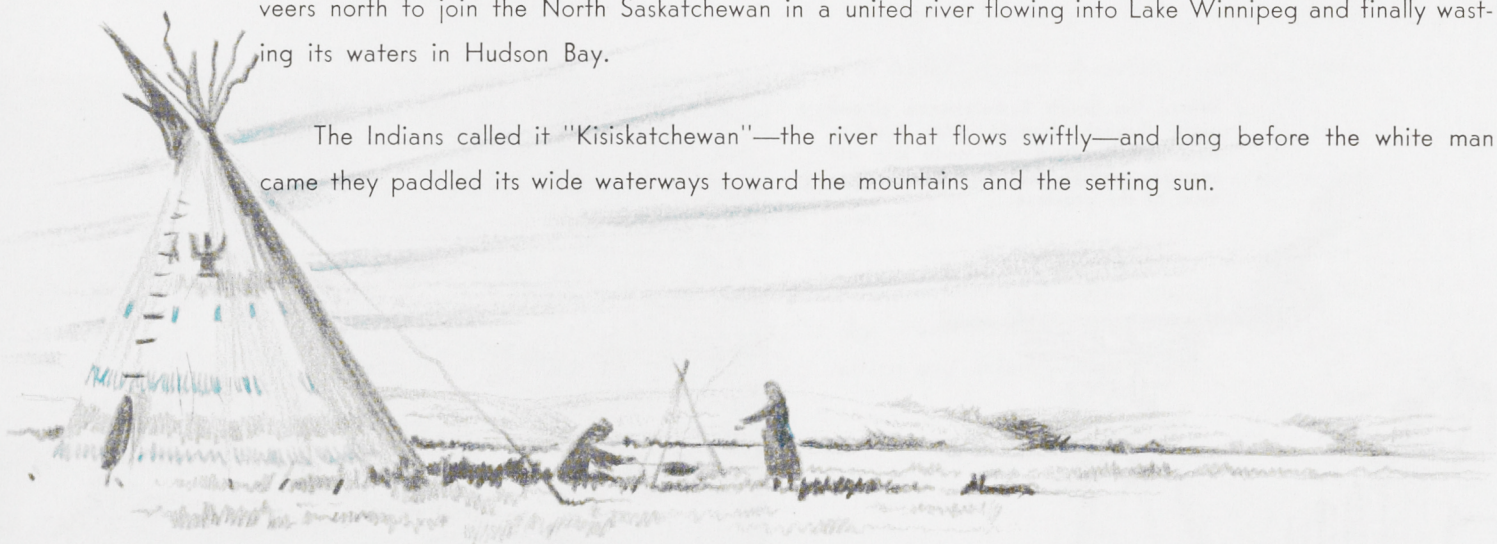


# THE SWIFT FLOWING WATER

From the glaciers of the Rocky Mountains torrential streams spill down the slopes onto the southern Alberta plains. Midway between Lethbridge and Medicine Hat two rivers meet, the Old Man and the Bow . . . and the broad South Saskatchewan is born.

Between steep banks it flows eastward through dry prairie land until, half-way across Saskatchewan, it veers north to join the North Saskatchewan in a united river flowing into Lake Winnipeg and finally wasting its waters in Hudson Bay.

The Indians called it "Kisiskatchewan"—the river that flows swiftly—and long before the white man came they paddled its wide waterways toward the mountains and the setting sun.



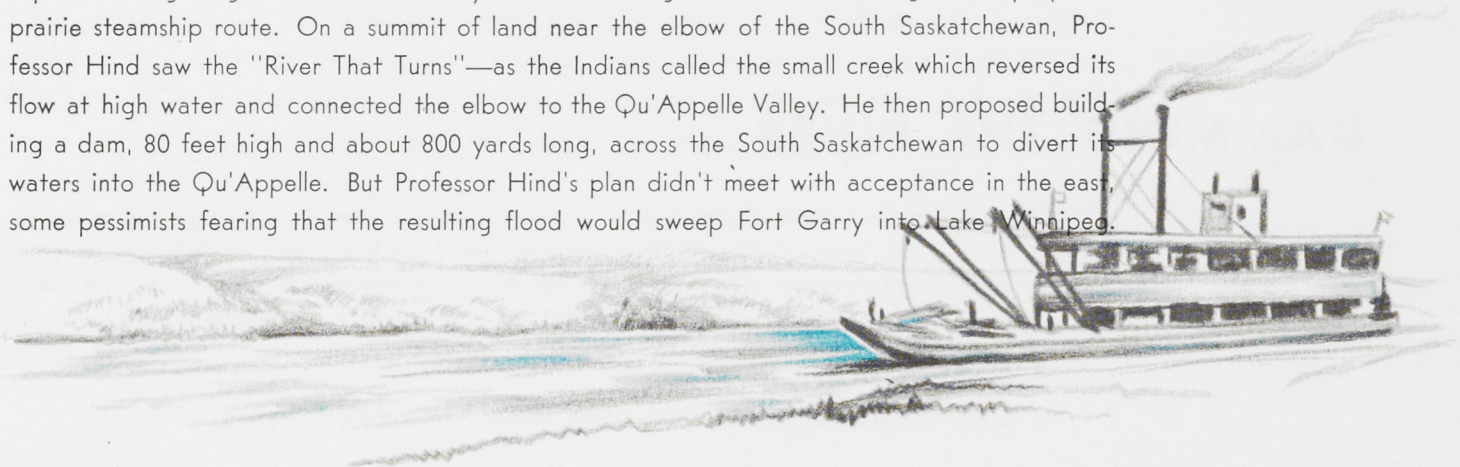


# EXPLORER'S DREAM

Later, explorers and fur traders penetrated the untamed west via the Saskatchewan's twin waterways . . . and a dream took shape in men's minds.

When Captain John Palliser's expedition (1857-1860) reached the South Saskatchewan, he dismissed the surrounding drought-ridden prairie as desert. But he did envision the river as a potential navigation route from Fort Garry to the foot of the Rockies—if the South Saskatchewan could be channelled into the Qu'Appelle River.

On Palliser's heels came the man who first dreamed of a dam on the river. Henry Hind, explorer and geologist, was instructed by the Canadian government to investigate the proposed prairie steamship route. On a summit of land near the elbow of the South Saskatchewan, Professor Hind saw the "River That Turns"—as the Indians called the small creek which reversed its flow at high water and connected the elbow to the Qu'Appelle Valley. He then proposed building a dam, 80 feet high and about 800 yards long, across the South Saskatchewan to divert its waters into the Qu'Appelle. But Professor Hind's plan didn't meet with acceptance in the east, some pessimists fearing that the resulting flood would sweep Fort Garry into Lake Winnipeg.





## DROUGHT

As early as 1919, the Saskatchewan government received a delegation which submitted plans for a water supply system to distribute water from the South Saskatchewan over a 3000 square mile area . . . but lack of money and engineering difficulties resulted in abandonment of the project.

The dream of a dam on the South Saskatchewan returned with the drying winds of the 'thirties' . . . when swirling dust storms swept across Palliser's 'desert' . . . a ten-year desert through which a river flowed.

By 1944, the Prairie Farm Rehabilitation Administration of the Dominion government had started the search for a favorable dam site. Men of vision said that a dam must be built to irrigate the parched land and bring water to the people of the south.

## DAMMING THE RIVER

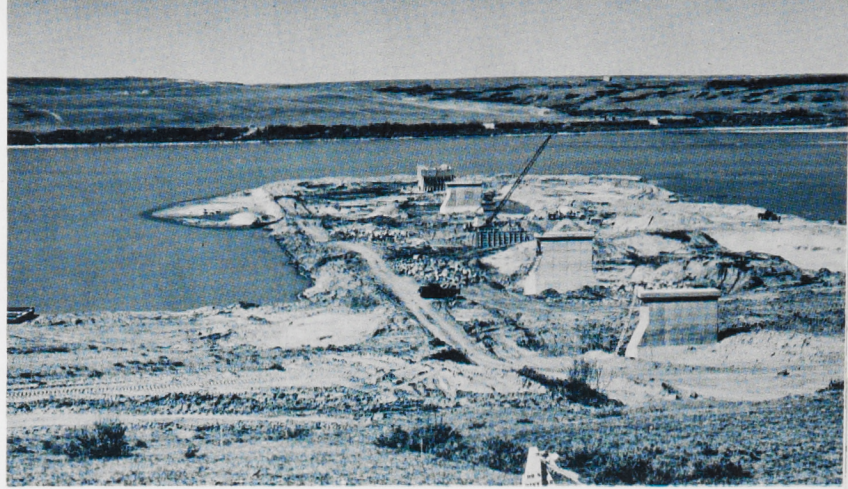
Where Palliser and Hind dreamed their dream a hundred years ago, a mighty dam is now taking shape. It will tower 210 feet above the river bed, reach nearly 17,000 feet from bank to bank, and will create a new lake 140 miles long, with a shoreline of nearly 500 miles. The South Saskatchewan reservoir will provide water for the eventual irrigation of five-hundred-thousand acres—and green fields will flourish where Palliser saw only desert!

No longer will all the waters of the South Saskatchewan flow wastefully to the sea.



The century-old dream of a dam becomes reality as foundation piers for the construction bridge forge out into the river.

## MULTI-PURPOSE STRUCTURE



**THE RESERVOIR WORKS** call for the construction of two dams—the main dam where Coteau Creek enters the South Saskatchewan, about 18 miles up-stream from Outlook; and a secondary dam across the Qu'Appelle Valley about 12 miles south-east of Elbow. The main dam, 210 feet high and with an over-all length of 16,700 feet, will be the largest rolled-earth dam ever built in Canada and one of the larger dams of its kind in the world.

The federal government, through its Prairie Farm Rehabilitation Administration, is responsible for the construction of all aspects of the reservoir except relocation of provincial highways, power and telephone lines. The total cost of the reservoir works, estimated at \$96 million, will be shared between the two governments—75 per cent to be borne by the federal government and 25 per cent by the provincial government.





**POWER FACILITIES** will include penstocks, turbines, power house, and the switchyard and transmission system tying in with the provincial grid. Saskatchewan is responsible for the construction of the power works, and will bear almost the entire cost—estimated at over \$45 million. The federal share of the penstocks (based on the use of some power for irrigation pumping) will be only 4 or 5 per cent of the expected cost of the power facilities.

**IRRIGATION WORKS** will consist of a main canal system, two secondary reservoirs, the pumping stations and the distribution system connecting the main canals with the individual irrigation farms—a system capable of bringing irrigation water to approximately 500,000 acres of land stretching from the Qu'Appelle Valley in the south to Saskatoon in the north. The province will be responsible for the construction and the full cost—over \$51 million—of the irrigation system, and is committed to develop at least 50,000 acres by the time the reservoir is completed.

The full cost of the reservoir, the complete irrigation system and the first stage of the power works is expected to total about \$192 million, of which the federal share will total about \$74 million and the provincial share, about \$118 million—or 62 per cent of the total cost.









## FROM DRYLAND FARMING . . .

*If a crystal droplet of river water  
could reflect the future for farmers  
along the South Saskatchewan,  
what would it reveal . . .*

A border ditch irrigation system spills water quickly and evenly over the thirsty land.

**MORE FARMS AND MORE FARM FAMILIES . . .** The long-range objective of 500,000 irrigated acres in the project will affect more than a thousand existing dryland farms, probably eventually doubling this number as irrigation and markets develop.

An irrigated farm is necessarily smaller than a dryland farm, but improved design and technology forecast a half-section, one-family farm with 200 or more acres irrigable. Farm size may decrease, however, as the project matures, because of the increased capital and labor demands of specialty crops.



# . . . TO IRRIGATION

**INCREASED FARM INCOME . . .** Production per acre is expected to double or triple. Costs will also increase, but will be more than compensated by the higher and more stable incomes. Detailed studies are necessary to determine what share of the capital cost of the distribution system may be borne by irrigation and still permit adequate income to farmers in the project.

Good land preparation means good irrigation. Land grading and smoothing will soon become familiar operations along the South Saskatchewan.





**FORAGE CROPS, DAIRY PRODUCTION AND BEEF CATTLE**, with wheat, oats, barley and flax, are expected to be the backbone of the irrigation project during its initial stages. A typical rotation might have one-half to one-third of the land in grain and the remaining one-half to two-thirds in hay or pasture crops.

An average irrigated pasture is expected to support one to two head of cattle per acre, and produce 400 to 600 pounds of beef per acre in the season. From hay yields of two to three tons per acre, the carrying capacity for winter fodder should be one animal per acre. Farmers will be encouraged to finish their cattle on coarse grains and forage grown on the irrigated land. Greater livestock production in the area, and resulting security to livestock enterprises in the surrounding areas as well, will probably be the first important impact of the irrigation project.

More red or blue label beef should result from locally finishing cattle on irrigated forage. This mechanical grazer 'feeds' a fresh legume-grass mixture to 40 head of steers.





Hay or pasture in conjunction with grain will be the irrigation farmer's mainstay during early stages of the project.



**SPECIALTY CROPS** will come—but later, depending on markets and availability of capital for processing plants and specialized farm machinery. Potatoes, peas and other fresh vegetables, canning and factory crops, and sugar beets may be grown in rotation with forage and grain, providing higher returns per acre.

Potatoes promise to be one of the first specialty crops from irrigated farms. Canning and factory crops will come later when markets, machinery and plants are available.

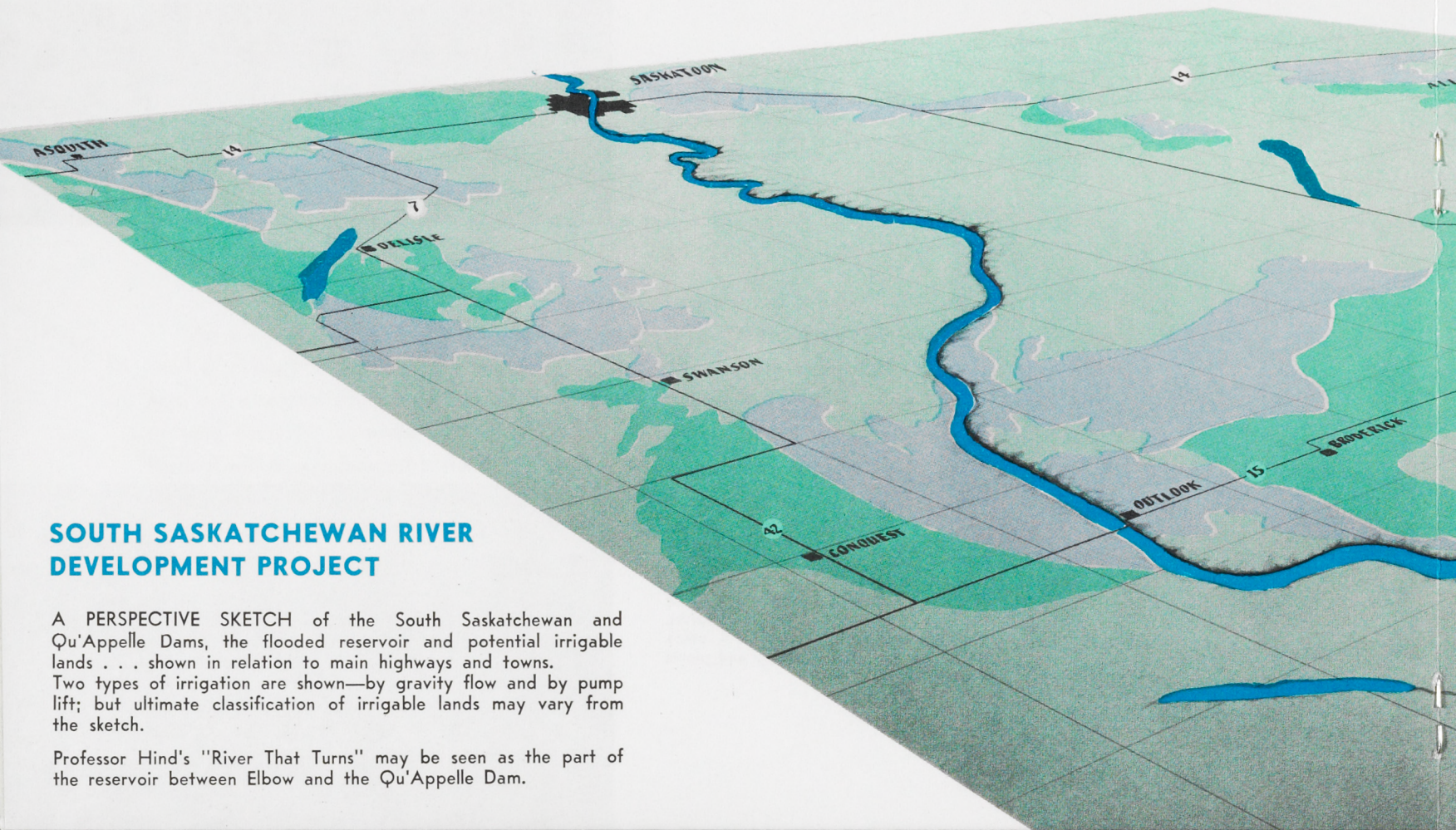




## SOUTH SASKATCHEWAN RIVER DEVELOPMENT PROJECT

A PERSPECTIVE SKETCH of the South Saskatchewan and Qu'Appelle Dams, the flooded reservoir and potential irrigable lands . . . shown in relation to main highways and towns. Two types of irrigation are shown—by gravity flow and by pump lift; but ultimate classification of irrigable lands may vary from the sketch.

Professor Hind's "River That Turns" may be seen as the part of the reservoir between Elbow and the Qu'Appelle Dam.

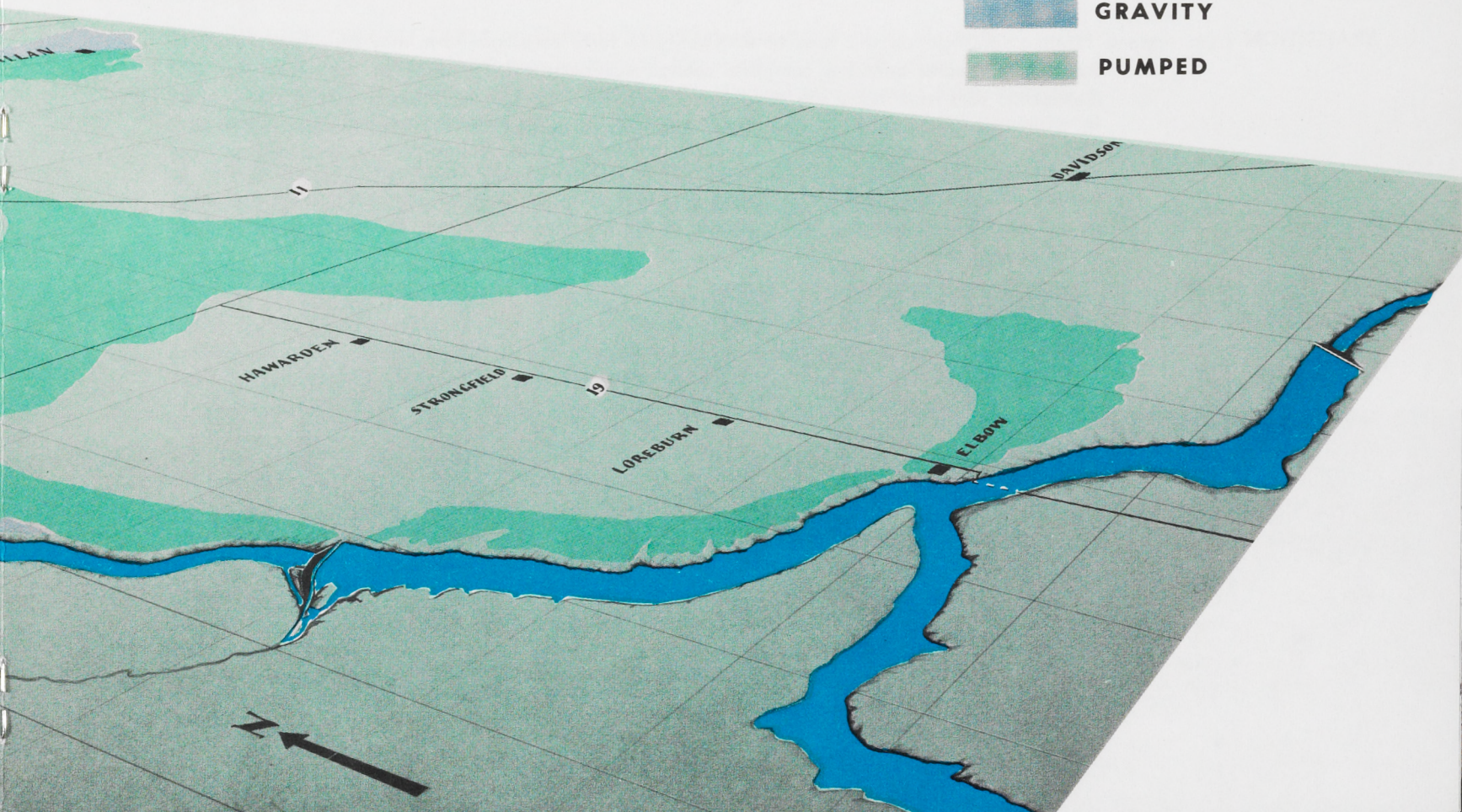




## IRRIGATION

 GRAVITY

 PUMPED





## SHAPE OF THINGS . . .

**TRANSITION** from dryland farming to irrigation will take time. Twenty to forty acres per farm may be added yearly to the irrigated acres until the complete change has been made. Many of the techniques and managerial skills required in the initial development will not be too different from those required for a dryland grain-cattle farm, but water application is a new skill that must be learned.

Even in the development stage, irrigation will widen the choice of farm enterprises to include forage crops, beef and dairying, and specialized production. It will offer new challenges as well as new opportunities to the people of the province as a whole, and particularly to those in the project area.

**AREAS TO BE IRRIGATED** will be selected on a basis of suitability of soils, engineering and economic feasibility . . . but irrigation must be desired by the farmers in areas chosen for initial development. A land use policy will grow out of discussion between the farmers themselves and the Saskatchewan government, and irrigation districts will be administered by locally-elected irrigation district boards.

**UNDER A PROVINCIAL RESEARCH PROGRAM**, jointly sponsored by the Saskatchewan Department of Agriculture and the University of Saskatchewan, 240 river bank acres on the University grounds in Saskatoon are being transformed into model irrigation units. Here, farmer-students and extension personnel may study all phases of irrigation engineering and water control. Close control of the water on the project will provide valuable information for studies of the effects of irrigation on typical Saskatchewan soils, while other studies will include methods of harvesting feed, the carrying capacity of pastures, planned water budgets for irrigated land, and the various types of irrigated cropping. Research into methods of facilitating handling of water on irrigated farms is one of the most urgent research objectives.

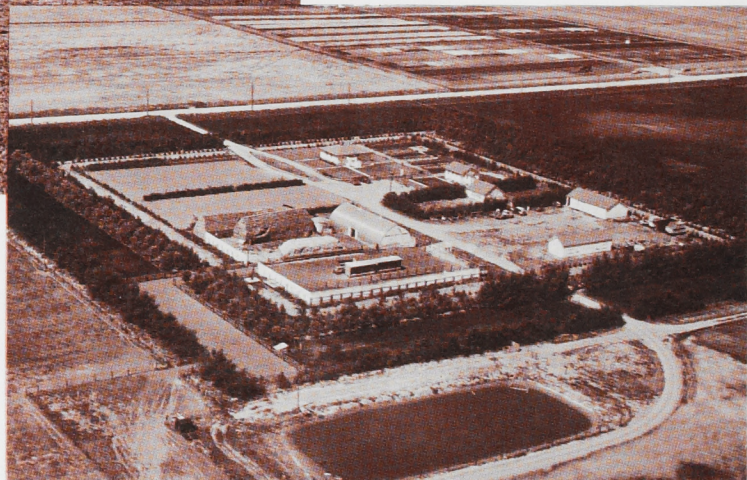


## . . . TO COME

**THE PRE-DEVELOPMENT FARM** at Outlook, Saskatchewan, established by the federal government in 1950, is a near-at-hand proving ground for irrigation practices under prevailing soil and climatic conditions. Sixteen acres, operated by the Federal Experimental Farms Service, is reserved for detailed experimental work on irrigated crops; while a 155 acre farm demonstrates farming practices and irrigation methods, typical beef enterprises and methods of handling cattle. A ten-year grain-grass rotation, plus commercial fertilizers, manure and legumes, has resulted in a steady improvement in crop yields since the project started.



Ten years of irrigation have transformed a town dumping ground into a model pre-development farm at Outlook.





# POWER FROM THE . . .

**POTENTIAL BENEFITS . . .** Although the main work of the harnessed South Saskatchewan River will be irrigation, power engineers estimate that available water could generate annually some 400 to 500 million kilowatt-hours of electrical energy.

A significant benefit of the South Saskatchewan project lies in the possibility of power development at such downstream sites as Fort a la Corne, Nipawin and Squaw Rapids, which together have about six times the energy potential of the present development. By regulating about half the flow of the main river, the dam on the South Saskatchewan could improve the usefulness of these more northern sites.

At the Squaw Rapids site alone, a dam placed upstream from Tobin Rapids, with a power plant below Squaw Rapids, could provide 200,000 kilowatts of "firm" capacity, and generate about 1,000 million kilowatt-hours in an average year, or more than twice the estimated amount of energy from the Outlook site. Involving lesser works than the Outlook project, a power project at Squaw Rapids may be in operation before the completion of the larger project.



Electricity comes to a Saskatchewan farm.

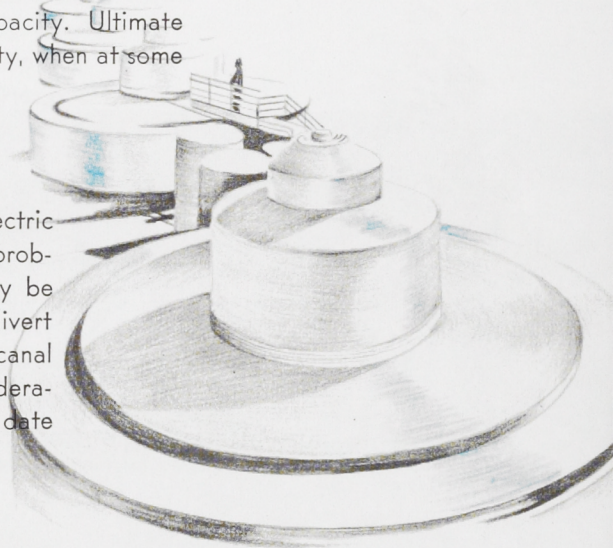


## . . . SOUTH SASKATCHEWAN

**A PEAK LOAD PLANT . . .** By the time the enormous storage reservoir of the South Saskatchewan project is completed, the proposed hydro plant at the site will fit effectively into the role of a peak load plant, operating in conjunction with existing plants of the Saskatchewan Power Corporation. The great capacity of the reservoir will enable the hydro plant to provide large amounts of power at peak loads over short periods, in spite of a relatively small total amount of energy.

With such a hydro installation meeting sudden short-time peak demands as they arise, the base load could then be carried on fuel-fired stations such as those at Estevan and Saskatoon, enabling them to operate continuously to their best advantage, at nearly full capacity. Ultimate installation at the South Saskatchewan site may well be double the initial capacity, when at some future time more peaking capacity is required by the province's electrical load.

**DESIGN FOR THE HYDRO PLANT . . .** The association of the hydro electric power plant with an earth-fill dam presents some difficulties—mainly the problem of conveying the water from the reservoir to the turbines. This may be effected by placing steel penstocks (pipes) in the mile long tunnels which divert the river during construction, or by separate penstocks, or possibly by a canal to a plant site lower down the river. These alternatives are still under consideration and final designs for the power plant have not been completed at the date of this publication.





# THE SOUTH SASKATCHEWAN BONUS

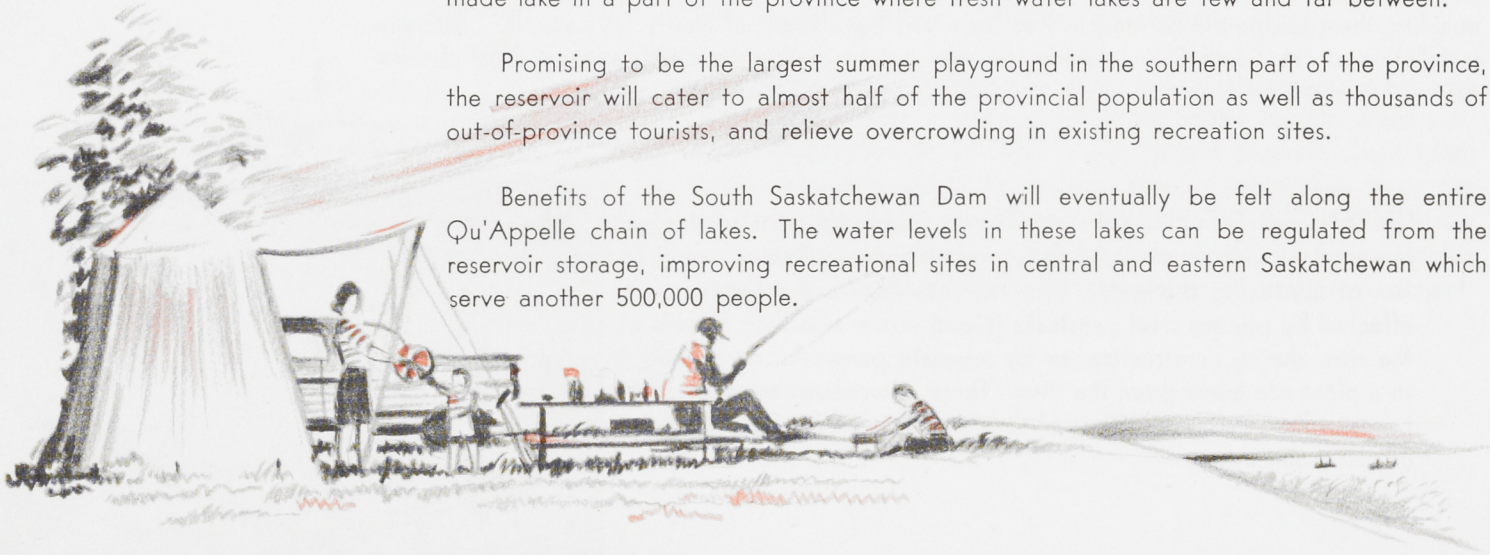
## A RECREATION RESOURCE . . .

Of all forms of outdoor recreation, water offers the greatest appeal, the greatest variety of fun—from boating . . . swimming . . . picnicking and camping . . . to fishing and hunting!

Within a few years after completion of the dam, the backed-up waters of the South Saskatchewan will form a reservoir with a shoreline of almost 500 miles—a great man-made lake in a part of the province where fresh water lakes are few and far between.

Promising to be the largest summer playground in the southern part of the province, the reservoir will cater to almost half of the provincial population as well as thousands of out-of-province tourists, and relieve overcrowding in existing recreation sites.

Benefits of the South Saskatchewan Dam will eventually be felt along the entire Qu'Appelle chain of lakes. The water levels in these lakes can be regulated from the reservoir storage, improving recreational sites in central and eastern Saskatchewan which serve another 500,000 people.





## LONG-RANGE DEVELOPMENT . . .

A **RECREATION CONSULTANT**, experienced in recreation planning in other parts of the province, has been appointed by the South Saskatchewan River Development Commission. Under his direction; aerial and ground surveys of the reservoir area will be followed by detailed studies to determine the best sites for recreational development. Potential sites will be sought for provincial, regional and municipal parks and for waterfowl and wild life refuge areas.

**TREE PLANTING PROJECTS** are being given first importance in planning recreation sites, because most of the river bank in the reservoir area is treeless. Trees will not only give needed shelter, but will protect soils against erosion and provide a suitable habitat for wild life.

Fishing reels will sing along the widened South Saskatchewan, as new game fish are added to native species.





**SPORTS FISHING AND BOATING** will be popular pastimes along the widened South Saskatchewan. A survey of fishing potential indicates that some fish species now in the river, such as goldeye, sauger, walleye and pike, will likely become valuable game fish in the reservoir. Reservoir conditions should also allow the introduction of trout and bass as sports fishes, while the deeper waters of the lake will be favorable to whitefish in commercial quantities—an important consideration to outfitters, cafe owners and tourists in resort areas.

**MIGRATORY WATERFOWL** will be attracted to the completed reservoir, and fall hunting concentrations are expected to gradually increase to 50,000 ducks and 10,000 geese. Waterfowl refuge areas have been proposed, permitting hunting on a controlled basis and reducing the threat to unharvested grain. Some game species such as deer, sharptailed grouse and beaver will be reduced by the flooding of the reservoir. The development of irrigation farming, however, is expected to produce a habitat highly suitable to pheasants.



The hunter will not wait long—the new lake will intercept main duck and geese flyways.



**THE DAM** itself will be a major tourist attraction during the construction years, and visitors may observe operations from a pavilion overlooking the river, with a parking area, grassed airstrip and a picnic site nearby. A motel, service station and lunch counter, located at the beginning of the east access road, are additional services to the travelling public.

**THE FLOODED RESERVOIR** will provide opportunity for many types of tourist development such as fishing and boating facilities, and picnic and camping sites. The provincial government is studying tourist requirements with a view to the development of appropriate resorts and accommodations along the lake.

Thoughtfully planned development will transform the South Saskatchewan reservoir into one of the choice vacation-lands of western Canada.

Almost from the Alberta border to Coteau Creek, a hundred-and-forty mile long lake will fill the South Saskatchewan valley . . . beckoning to its shores the outdoorsman, the nature lover, tourists and family vacationers.





# THE RIVER HARNESSSED

## . . . TO SERVE INDUSTRY

Saskatchewan, while still the nation's "bread basket", no longer depends on a single crop. As resource development industries multiply, so secondary and service industries will grow. Oil and gas discoveries in the province, for example, create a market for pipeline and steel plate . . . and perhaps iron production from Saskatchewan ore. These industries are thirsty . . . steel needs water for cooling, washing, cleaning and chemical processing. Water from the South Saskatchewan, available in abundant and assured quantities, will be a key factor in the future industrial development of southern Saskatchewan.

## . . . AND A GROWING POPULATION

Irrigation farming and industrial development will bring increased population to the province, particularly in urban centers. Cities need water. To the water-short cities of Moose Jaw and Regina, the new dam means that an adequate level can be maintained by gravity flow in Buffalo Pound Lake in the Qu'Appelle Valley. It may also be possible to pipe water to smaller population centers, just as oil and gas are distributed by pipeline.

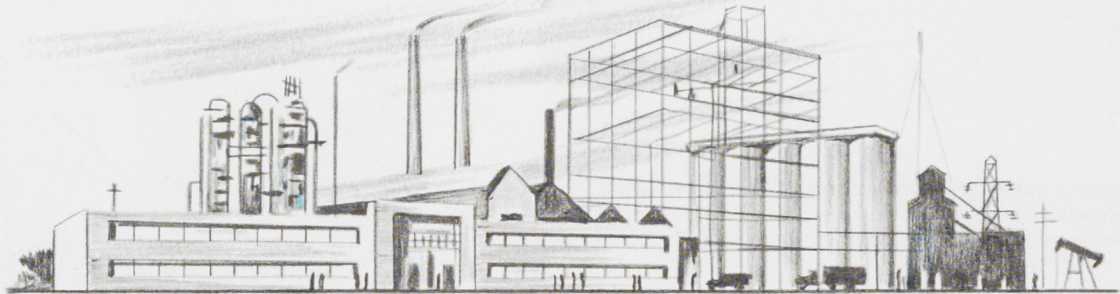


## . . . TO CONTROL FLOODING

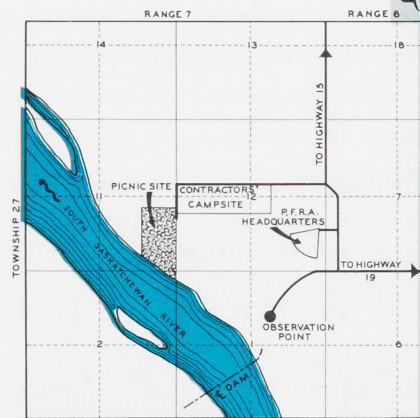
A river development project must be concerned with too little water—or too much. Although flooding along the South Saskatchewan is not a major problem, the Pike Lake area in the vicinity of Saskatoon and the Carrot River, area near The Pas have experienced flooding in the past. The South Saskatchewan Dam will be a first step in controlling the river in these danger areas.

## . . . AND TO ENSURE THE FUTURE

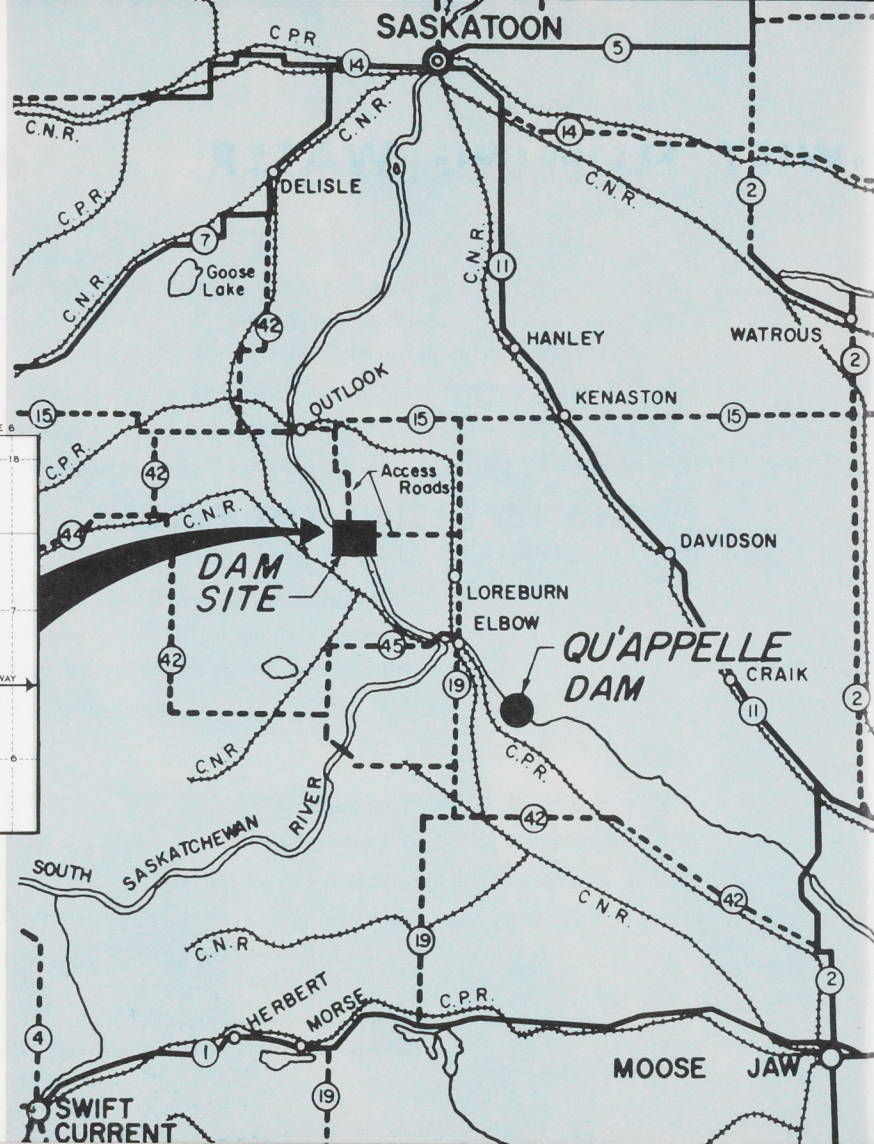
Development of the South Saskatchewan promises an assured supply of water to a province already rich in agricultural and mineral resource . . . bringing with it the potential to stabilize agriculture, to generate hydro power, and to broaden the economic base of this province and the nation.







THE SOUTH SASKATCHEWAN DAM SITE, showing access roads, the observation point where a visitors' pavilion overlooks the dam construction, and—two miles downstream—a conveniently equipped picnic site fronting the river.





PROVINCE OF SASKATCHEWAN

# **SOUTH SASKATCHEWAN RIVER DEVELOPMENT COMMISSION**

HON. T. C. DOUGLAS

Legislative Building

MINISTER

Regina

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